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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,000	02/01/2006	Kwang-jin Lee	NEK-0012	9626
23413 7590 06/09/2010 CANTOR COLBURN, LLP 20 Church Street 22nd Floor Hartford, CT 06103				
EXAMINER LENIHAN, JEFFREY S				
ART UNIT		PAPER NUMBER		
1796				
NOTIFICATION DATE		DELIVERY MODE		
06/09/2010		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptopatentmail@cantorcolburn.com

### Office Action Summary

**Application No.**

10/567,000

**Applicant(s)**

LEE ET AL.

**Examiner**

Jeffrey Lenihan

**Art Unit**

1796

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 February 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3,4,7,11,13-15,20 and 22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,7,11,13-15,20 and 22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. This Office Action is responsive to the amendment filed on 2/12/2010.
2. The objections and rejections not addressed below are deemed withdrawn.
3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office Action.

***Claim Objections***

4. Claim 22 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 22 depends from claim 1 and states that the acryl seed latex is composed of 2.23 parts by weight (pbw) styrene as the vinyl monomer (i), 0.25 pbw acrylonitrile as the hydrophilic monomer (ii), and 0.02 pbw divinylbenzene as the cross-linking monomer (iii). Independent claim 1, however, recites that the minimum amounts for components (i), (ii), and (iii) in the seed are 60 pbw, 0.5 pbw, and 0.5 pbw, respectively. Claim 22 therefore broadens the scope of the parent claim rather further limiting it.

***Claim Rejections - 35 USC § 112***

5. Claims 1, 3, 4, 7, 11, 13-15, 20, 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claims 1 and 22 recite new values for the amount of each component in the claimed impact modifier; these limitations are inherited by all dependent claims. Claims 1 and 22 state that the amounts of components (B)(i)(a) and (B)(i)(b) fall within ranges that are based on 0.01 to 10 parts by weight (pbw) of acryl seed latex (A). Amounts of a component in pbw are typically defined relative to a set value—for example, a composition may comprise 50 to 200 pbw of component X based on 100 pbw of component Y. It is unclear what composition is described by basing the ranges for the contents of components (B)(i)(a) and (B)(i)(b) on a non-set value. In claim 1, it is also unclear whether the claim is intended to require that the impact modifier comprises 0.01 to 10 pbw of the seed, or if the amount of seed can be any number so long as the claimed relationship is met. Finally, as currently written, it is unclear what the amounts of components (B)(ii)(a)-(c) are based on—i.e., are they based on the total weight of the silicone rubber, the impact modifier, etc. For the purposes of examination on the merits, the claim has been interpreted to require an impact modifier comprising 0.01 to 10 pbw of a seed, wherein the ranges recited for each component are based on the total weight of the final impact modifier. Similarly, the amounts recited for the monomers in the seed in claim 22 have been interpreted as being based on the total weight of the impact modifier.

7. Claim 4 has been amended to state that the claimed monomer is chosen from the group consisting of “an alkyl acrylate including ethylacrylate, butylacrylate, and 2-ethylhexylacrylate;” etc. It is unclear whether the claim is intended to be restricted to only the use of ethyl-, butyl-, or 2-ethylhexylacrylate as the claimed monomer, or if any

alkyl acrylate may be used as the claimed monomer (A)(ii). The recitation "an alkyl methacrylate including..." is indefinite per the same rationale.

***Claim Rejections - 35 USC § 103***

8. Claims 1, 3, 4, 7, 11, 13-15, 20, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ahn et al, WO 2004/058839, in view of Miyatake et al, US5804655.

9. The rejection stands as per the reasons outlined in the previous Office Action, incorporated herein by reference.

10. Regarding the amendments to the claims: As discussed in the Office Action mailed on 10/16/2008, incorporated herein by reference, Ahn discloses a multi-layer impact modifier comprising 0.5 to 40 pbw, based on the total weight of said impact modifier, of a seed. Said seed comprises 65 to 99.4 pbw styrene, 0.5 to 30 pbw acrylonitrile, and 0.1 to 5 pbw divinylbenzene, based on the total weight of the monomers used to make said seed. Based on 1) the amount of seed present in the impact modifier, and 2) the amount of each monomer used to make the seed, one of ordinary skill in the art will recognize that, based on the total weight of the final impact modifier, Ahn discloses a seed comprising .325 to 39.76 pbw styrene (for claim 22), 0.0025 to 12 pbw acrylonitrile (for claim 22), and 0.000005 to 2 pbw divinylbenzene (for claim 22).

11. Similarly, the impact modifier of Ahn comprises 50-89.5 pbw of an acrylic rubber core, and 10-49.5 pbw of a shell, wherein these amounts are based on the total weight

of the impact modifier. Said rubber core comprises 95 to 99.9 pbw butyl acrylate and 0.1 to 5 pbw 3-butanediol diacrylate based on the weight of the rubber core; the impact modifier of Ahn therefore comprises a rubber core comprising 47.5 to 89.41 pbw butyl acrylate (for claims 1, 22) and 0.05 to 4.475 pbw 3-butanediol diacrylate (for claims 1, 22) based on the total weight of the impact modifier. Said shell comprises 95 to 99.9 pbw C<sub>1</sub> to C<sub>4</sub> alkyl methacrylate based on the weight of the shell; the final impact modifier therefore comprises a shell comprising 9.5 to 49.5 pbw alkyl methacrylate (for claim 1).

12. Miyatake discloses that the silicone rubber component 80 to 99% by weight octamethylcyclotetrasiloxane (for claim 1) (Column 9, line 45), 0.1-10% of a cross-linking agent such as tetramethoxysilane, 0.1-10% by weight of a graft-linking agent such as tetravinyltetramethylcyclotetrasiloxane (for claim 1) (Column 10, line 4). Said silicone rubber is combined with an acrylic rubber in a ratio of 45 to 5000 pbw silicone rubber per 100 pbw acrylic rubber. Based on this ratio, it would therefore have been obvious to modify the rubber core of the impact modifier of Ahn, comprising 50 to 89.5 pbw of acrylic rubber, with 22.5 to 4475 pbw of silicone rubber. Based on the amount for each component disclosed by Miyatake, the final impact modifier would therefore comprise 18 to 4430.25 pbw octamethylcyclotetrasiloxane (for claim 1), 0.0225 to 447.5 pbw tetramethoxysilane (for claim 1), and 0.0225 to 447.5 pbw tetravinyltetramethylcyclotetrasiloxane (for claim 1) based on the total weight of the impact modifier.

13. It has been held that in the case where the claimed ranges overlap or lie inside ranges disclosed in the prior art, a *prima facie* case of obviousness exists; see *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) (MPEP § 2144.05). As discussed above, Ahn discloses an impact modifier comprising 0.5 to 40 pbw of a seed, overlapping the claimed range. Barring a showing of factual evidence demonstrating unexpected results commensurate in scope with the claimed invention, it therefore would have been obvious to one of ordinary skill in the art to prepare an impact modifier comprising the claimed amount of seed latex. Furthermore, as the ranges taught by the prior art overlap the claimed ranges for each component of the claimed invention; it would have been obvious to one of ordinary skill in the art at the time the invention was made to prepare an impact modifier comprising the claimed amounts of each component.

#### ***Response to Arguments***

14. Applicant's arguments filed 2/12/2010 have been fully considered but they are not persuasive.

15. Applicant's arguments regarding the claimed amounts of each component are addressed earlier in this Office Action.

16. Applicant argues that unexpected results are obtained from the claimed invention; however, the allegedly unexpected results are not commensurate in scope with the claims as currently written. The difference between the claimed invention and the primary reference is the inclusion of the silicone rubber in the core. As currently

written, the independent claim reads on an impact modifier wherein the silicone rubber core comprises 0.98 pbw cyclic organosiloxane, 0.15 pbw cross-linking agent, and 0.05 pbw graft-linking agent; the claim therefore reads on an impact modifier wherein the amount of silicone rubber, based on the sum of the amounts of its components, is as low as 1.18 pbw. The minimum amount of silicone rubber in applicant's inventive examples, however, is 10 pbw (see Examples 1, 6-9, and 20-27), which is almost ten times greater than the lower limit allowed by the claims. Applicant therefore has not provided evidence demonstrating that the allegedly unexpected results are obtained commensurate in scope with the composition recited in the currently pending claims.

17. Regarding applicant's reference to the Final Office Action mailed on 4/28/2009 (see remarks page 10, 2<sup>nd</sup> paragraph): Applicant's remarks submitted on 1/16/2009 presented the argument that the teachings of Miyatake required that the acrylic rubber comprise a monomer, A-3. The claims pending at that time recited that the acrylic rubber consisted of the claimed elements; applicant therefore argued that 1) the presence of A-3 distinguished the claimed invention from the prior art, and 2) there was no motivation to omit monomer A-3 from the combination of Ahn and Miyatake. The statement referred to by applicant was part of the examiner's response to applicant's allegation that there was no motivation to omit monomer A-3. The examiner notes, however, that the currently pending claims are not written in closed language, and therefore do not require the omission of any unclaimed elements recited in the prior art. Arguments regarding this statement by the examiner are therefore not relevant to patentability of the currently pending claims.



18. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). As discussed in previous Office Actions, Miyatake teaches that grafting silicone rubber onto acrylic rubber results in an impact modifier which provides good weather resistance to PVC. Barring a showing of factual evidence demonstrating unexpected results commensurate in scope with the claimed invention, it would therefore have been obvious to modify the composition of Ahn as discussed in the previous Office Actions, incorporated herein by reference.

### ***Conclusion***

19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey Lenihan whose telephone number is (571)270-5452. The examiner can normally be reached on Monday through Thursday from 7:30-5:00 PM, and on alternate Fridays from 7:30-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James J. Seidleck can be reached on 571-272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Irina S. Zemel/  
Primary Examiner, Art Unit 1796

/Jeffrey Lenihan/  
Examiner, Art Unit 1796

/JL/